

MIAMI DADE COLLEGE
 MATHEMATICS DEPARTMENT
 INTERAMERICAN CAMPUS
 COLLEGE ALGEBRA
 STUDY GUIDE
 EQUATIONS AND INEQUALITIES

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Solve the equation.

1) $3x - 4 - 4(x + 1) = 3x - 4$

- A) $\{\frac{1}{4}\}$ B) $\{-\frac{2}{5}\}$ C) $\{-1\}$ D) $\{3\}$

1) _____

Solve the equation by factoring.

2) $3x^2 + 11x - 4 = 0$

- A) $\{-\frac{1}{3}, -4\}$ B) $\{\frac{1}{3}, -4\}$ C) $\{\frac{1}{3}, 4\}$ D) $\{-\frac{1}{3}, 4\}$

2) _____

Find the real solutions, if any, of the equation. Use the quadratic formula.

3) $x^2 - 12x - 11 = 0$

- A) $\{6 + \sqrt{47}, 6 - \sqrt{47}\}$ B) $\{-6 + \sqrt{47}, -6 - \sqrt{47}\}$
 C) $\{6 + \sqrt{11}, 6 - \sqrt{11}\}$ D) $\{12 + \sqrt{47}, 12 - \sqrt{47}\}$

3) _____

Write the expression in the standard form $a + bi$.

4) $(4 + 3i) - (-8 + i)$

- A) $12 - 2i$ B) $12 + 2i$ C) $-12 - 2i$ D) $-4 + 4i$

4) _____

5) $(8 + 9i)(2 - 5i)$

- A) $61 - 22i$ B) $-45i^2 - 22i + 16$ C) $-29 + 58i$ D) $61 + 22i$

5) _____

6) $\frac{3}{1 + 7i}$

- A) $\frac{3}{50} - \frac{21}{50}i$ B) $-\frac{1}{16} + \frac{7}{16}i$ C) $-\frac{1}{16} - \frac{7}{16}i$ D) $\frac{3}{50} + \frac{21}{50}i$

6) _____

Find the real solutions of the equation.

7) $\sqrt{3x - 2} = 2$

- A) $\{4\}$ B) $\{2\}$ C) $\{\frac{4}{3}\}$ D) $\{\frac{2}{3}\}$

7) _____

8) $\sqrt{x + 7} + \sqrt{x} = 3$

- A) $\{4\}$ B) $\{\frac{1}{9}\}$ C) $\{1\}$ D) no real solution

8) _____

9) $3x^4 + 13x^2 - 10 = 0$

- A) $\{-\sqrt{5}, \sqrt{5}\}$ B) $\{-\frac{2}{3}, \frac{2}{3}\}$ C) $\{-\sqrt{\frac{5}{3}}, \sqrt{\frac{5}{3}}\}$ D) $\{-\sqrt{\frac{2}{3}}, \sqrt{\frac{2}{3}}\}$

9) _____

Find the real solutions of the equation by factoring.

10) $x^3 - 100x = 0$

A) $\{0, -10\}$

B) $\{0, 10\}$

C) $\{0, 10, -10\}$

D) $\{0, 100\}$

10) _____

11) $x^3 + 6x^2 - 9x - 54 = 0$

A) $\{3, -6\}$

B) $\{-3, 3, -6\}$

C) $\{9, -6\}$

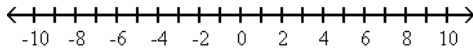
D) $\{-3, 3, 6\}$

11) _____

Solve the inequality. Express your answer using interval notation. Graph the solution set.

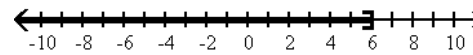
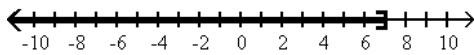
12) $5 - 3(1 - x) \leq 20$

12) _____



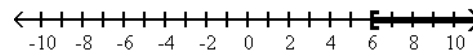
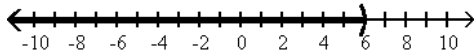
A) $(-\infty, 7]$

B) $(-\infty, 6]$



C) $(-\infty, 6)$

D) $[6, \infty)$



Solve the equation.

13) $|x| = 4$

A) $\{-4\}$

B) $\{16\}$

C) $\{-4, 4\}$

D) $\{4\}$

13) _____

14) $|x| = -6$

A) $\{6, -6\}$

B) $\{-6\}$

C) $\{6\}$

D) no solution

14) _____

15) $|x| + 1 = -7$

A) $\{8, -8\}$

B) $\{-8\}$

C) $\{8\}$

D) no solution

15) _____

16) $3|x - 3| = 18$

A) $\{3, -9\}$

B) $\{9, -3\}$

C) $\{3\}$

D) no solution

16) _____

Solve the inequality. Express your answer using interval notation. Graph the solution set.

17) $|x| < 7$

A) $[0, 7]$

B) $(-7, 7)$

C) $(-\infty, -7)$ or $(7, \infty)$

D) $(-\infty, -7)$ and $(7, \infty)$

17) _____

18) $|x| < -11$

A) $(-11, 11)$

B) $\{-11\}$

C) $(-\infty, \infty)$

D) no solution

18) _____

19) $|x| > -7$

A) $\{7\}$

B) $(-7, 7)$

C) $(-\infty, \infty)$

D) no solution

19) _____

20) $|5 - 7x| > 9$

A) $(-\infty, -\frac{4}{7})$ or $(\frac{4}{7}, \infty)$

B) $(-\frac{4}{7}, 2)$

C) $(-\infty, -\frac{4}{7})$ or $(2, \infty)$

D) $(-\frac{4}{7}, \infty)$ or $(2, \infty)$

20) _____

21) $|5x - 1| \geq 5$

A) $(-\infty, -\frac{4}{5}]$ or $[\frac{6}{5}, \infty)$

B) $(-\infty, -\frac{4}{5})$ or $(\frac{6}{5}, \infty)$

C) $[-\frac{4}{5}, \frac{6}{5}]$

D) $(-\frac{4}{5}, \frac{6}{5})$

21) _____

Find the real solutions of the equation.

22) $x^4 - 50x^2 + 49 = 0$

A) $\{-49, 49\}$

B) $\{-7, 7\}$

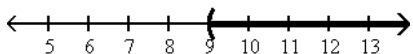
C) $\{-50, 50\}$

D) $\{-1, 1, -7, 7\}$

22) _____

Express the graph shown using interval notation. Also express it as an inequality involving x.

23)



A) $[9, \infty)$
 $x \geq 9$

B) $(-\infty, 9]$
 $x \leq 9$

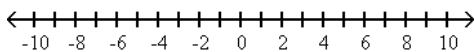
C) $(9, \infty)$
 $x > 9$

D) $(-\infty, 9)$
 $x < 9$

23) _____

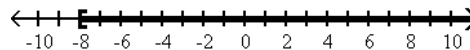
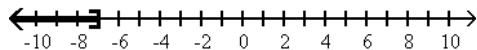
Solve the inequality. Express your answer using interval notation. Graph the solution set.

24) $4 - 2(1 - x) \leq -14$



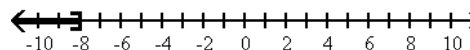
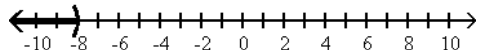
A) $(-\infty, -7]$

B) $[-8, \infty)$



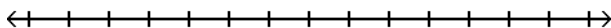
C) $(-\infty, -8)$

D) $(-\infty, -8]$

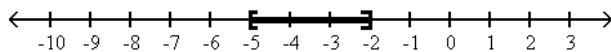


24) _____

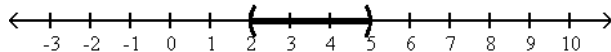
25) $9 \leq 2x + 5 \leq 15$



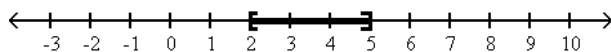
A) $[-5, -2]$



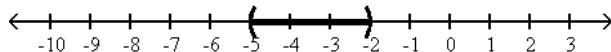
B) $(2, 5)$



C) $[2, 5]$



D) $(-5, -2)$



25) _____